



KEEPING OUR PLANET COOL, STRENGTHENING FOOD SECURITY WITH SUSTAINABLE COLD CHAINS

ACCESS TO SUSTAINABLE FOOD COLD CHAIN: OPPORTUNITIES, CHALLENGES AND THE WAY FORWARD



> 12TH JULY 2022

COLD CHAINS MATTER: WHY WE NEED TO INCREASE ACCESS

Food saved is as important as food produced

- Of the total food produced for human consumption, 14% is lost before the food reaches consumers
- Food loss post-harvest reduces the income of 470 million smallholder farmers by as much as 15%

Lack of cold chain leads to considerable food losses

- Lack of effective refrigeration directly results in the loss of 526 million tons of food production, 12% of the global total
- Food lost due to lack of cold chain would be enough to feed 1 billion people

But business-as-usual in cold chain development has implications for climate change

- Combined, emissions from cold chain technologies and from food lost due to lack of refrigeration amount to 4% global GHG emissions
 - Emissions are set to rise significantly as new cold chain infrastructure comes online in developing countries
-

A COOL COALITION: A GLOBAL NETWORK

The **Cool Coalition** – community of over 120 members collaborating to **support countries and industry take comprehensive action** to meet growing demands for **cooling in an efficient, climate-friendly manner** contributing to the SDGs, the Kigali Amendment, and Paris Agreement.

26 Country Governments



18 International Organisations



34 Civil Society Organisations



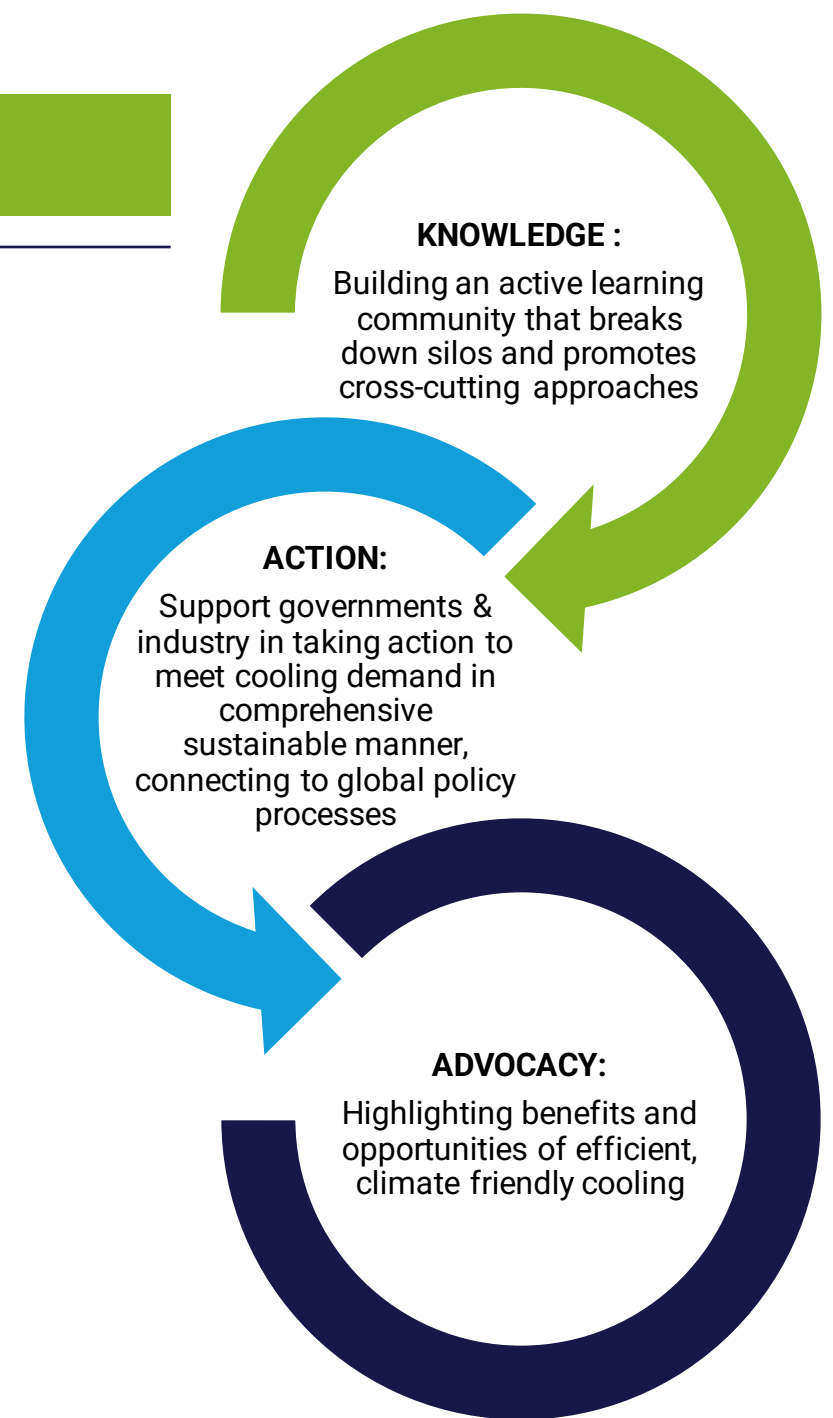
4 Academia Stakeholders



30 Private Sector Stakeholders

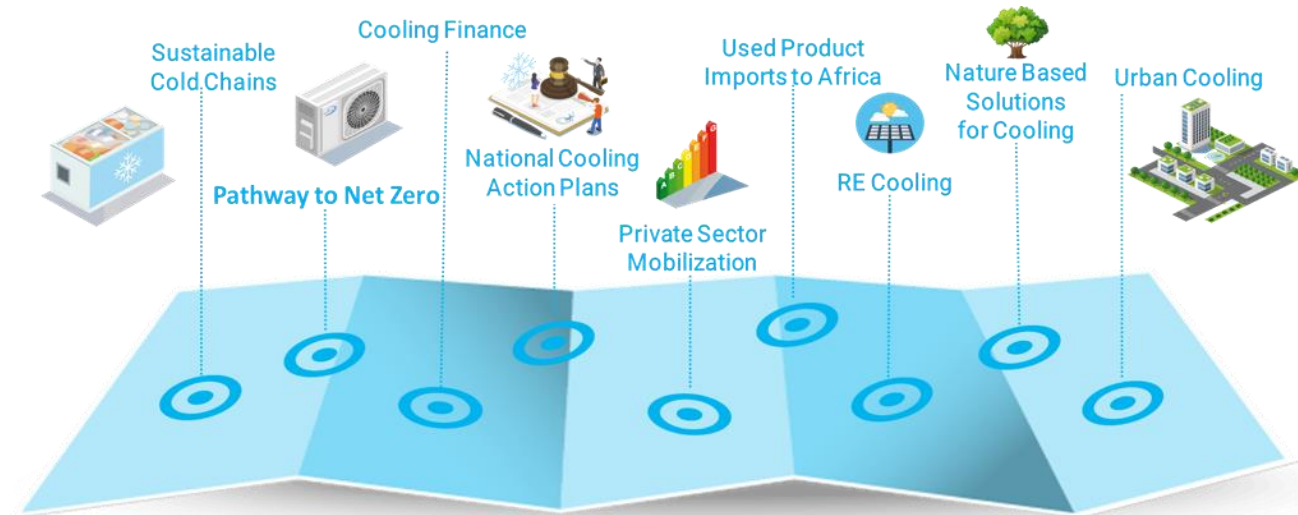


10 City Governments



We promote a **comprehensive approach** to *reduce* the need for mechanical cooling, *shift* to cooling with lower emissions, *improve* efficiency, *protect* those vulnerable from a lack of cooling; *leverage* cooperation to achieve greater collective impacts

Since its inception, Cool Coalition members have launched **9 working groups** on key transformational topics for the cooling sector:

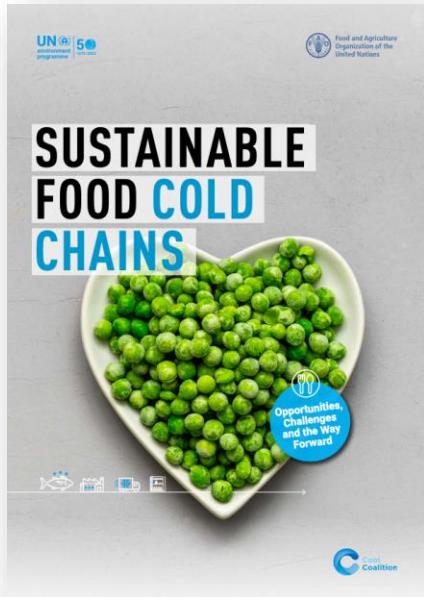


The Cool Coalition has (co)produced over **30 reports, policy briefs, methodologies and toolkits** spanning across sectors and intervention areas.



Sustainable Cold Chain Working Group

- Developing the **knowledge base** - needs assessments, toolkits, methodologies, reports
- **Build governments' capacity** and **create an ecosystem of stakeholders** to coordinate cold chain development nationally.



The Report at a Glance

- Documents **status** of food cold chains globally, drivers, key barriers and challenges in sustainable cold chain development.
- Highlight **benefits and opportunities** for further development drawn from examples of successful implementation.
- Over **80 case studies and best practices** on existing technologies, projects, finance and business models, and enabling policies, both at local and international levels.
- Outlines **recommendations** for comprehensive action to accelerate sustainable cold chain development and foster cooperation among actors to accelerate action globally.

Developed by:



Food and Agriculture
Organization of the
United Nations

In the framework of:



In cooperation with:



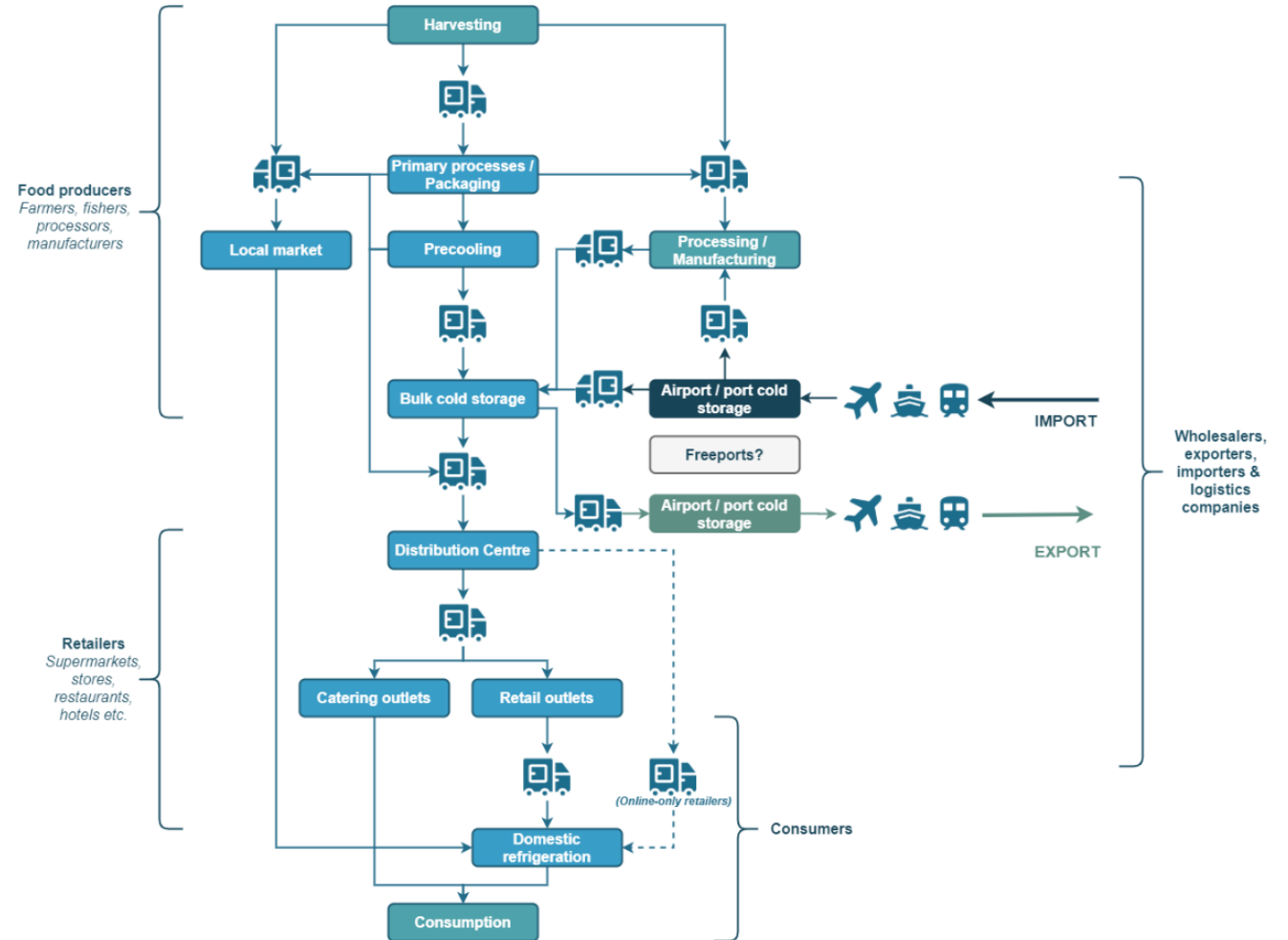
CLIMATE &
CLEAN AIR
COALITION
TO REDUCE SHORT-LIVED
CLIMATE POLLUTANTS



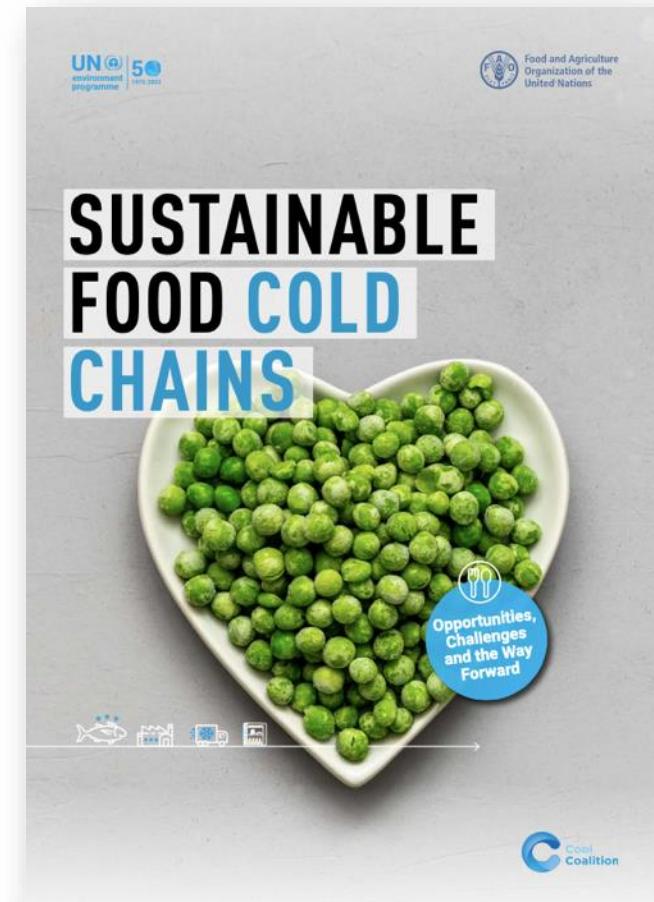
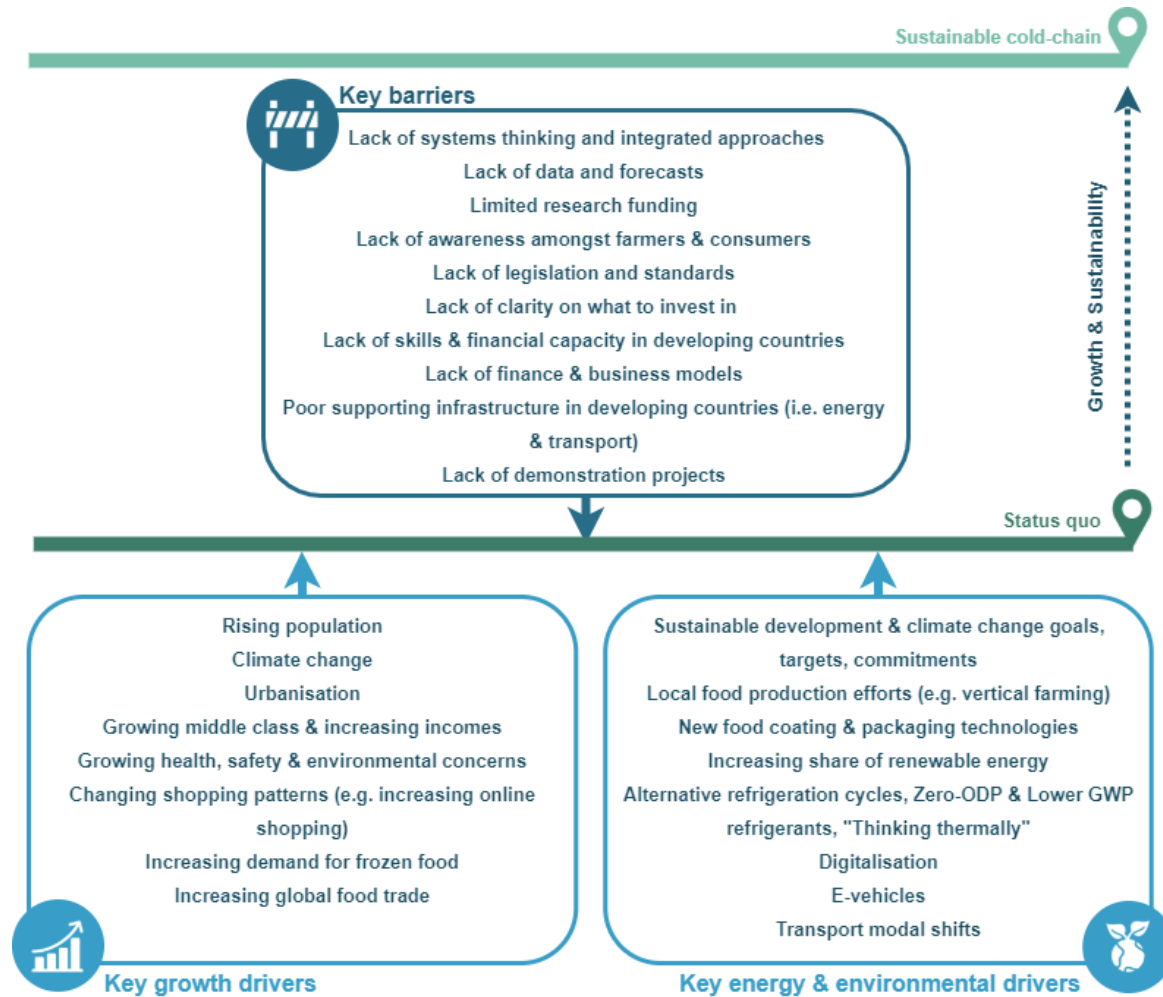
MINISTERO DELLA
TRANSIZIONE ECOLOGICA

COLD CHAIN AS A WICKED PROBLEM

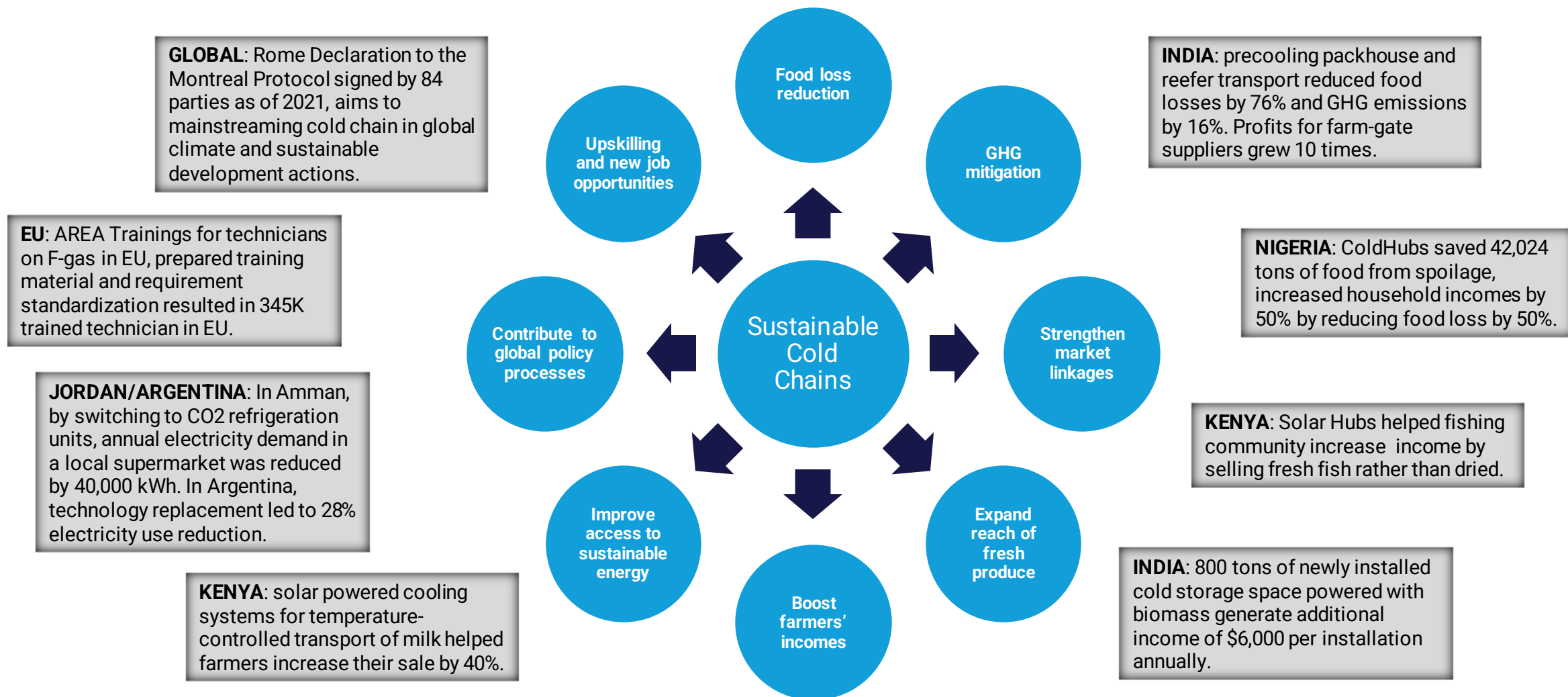
- Cold chain is more than cold storage
- Essential to the big challenges – food security, nutrition, rural economic growth...
- Need an end-to-end system-level approach



ACCESS TO SUSTAINABLE COLD CHAINS

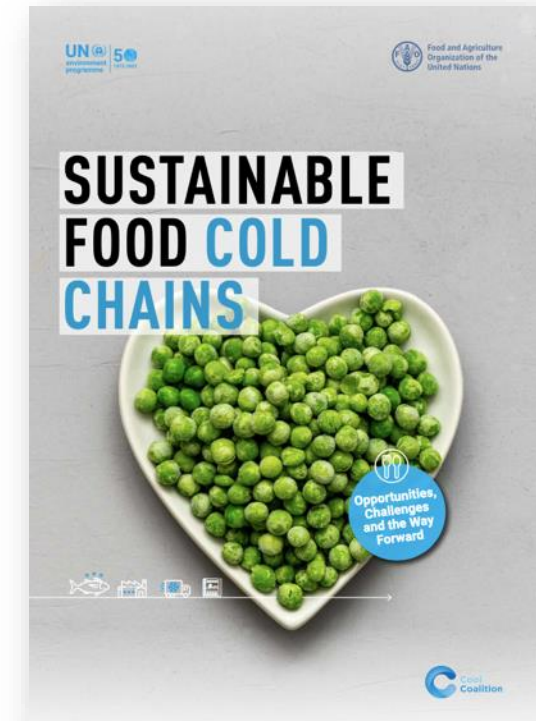


REPORT FINDINGS: BENEFITS OF SUSTAINABLE COLD CHAIN



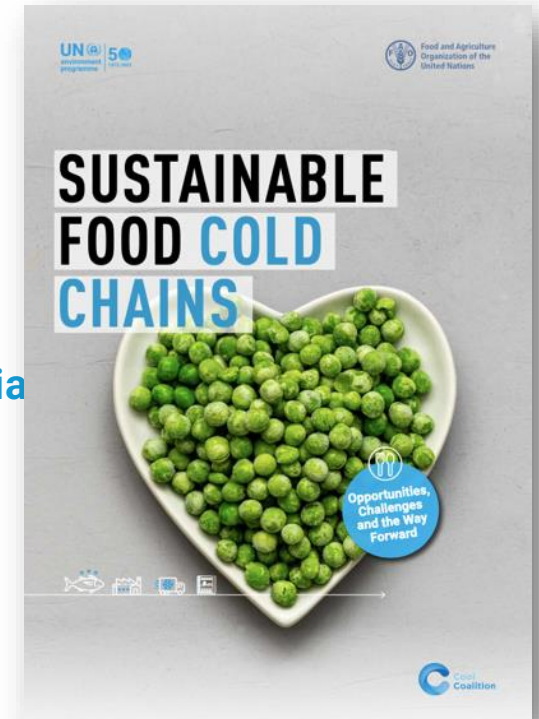
KEY BARRIERS

- Lack of systems-level thinking and an integrated approach
- Limited robust evidence-based data and forecasts
- Inadequate legislation and standards
- Lack of clarity on what to invest in.
- Limited financial support for sustainable cold chain development
- Lack of skilled technicians
- Dumping of sub-standard equipment to developing countries
- Lack of or unreliable energy access and infrastructure,
- Lack of demonstration projects



To accelerate the development of sustainable food cold chain, we need to work collaboratively to:

- quantify and value the broader socio-economic impacts of sustainable cold chains
- **Baseline** cold chain infrastructure and **quantify** energy use, emissions, food loss with **cold chain needs assessments** and **National Cooling Action Plans**.
- Take **holistic systems approaches** - cooling technologies alone are not sufficient.
- Develop costed and sequenced **long-term plans and policies**, as well as provide **financial assistance and capacity support** for sustainable cold chain components.
- **Build necessary skills** and capacity as well as finance and **equitable business models**.
- Run **large-scale system demonstrations** to show impact.



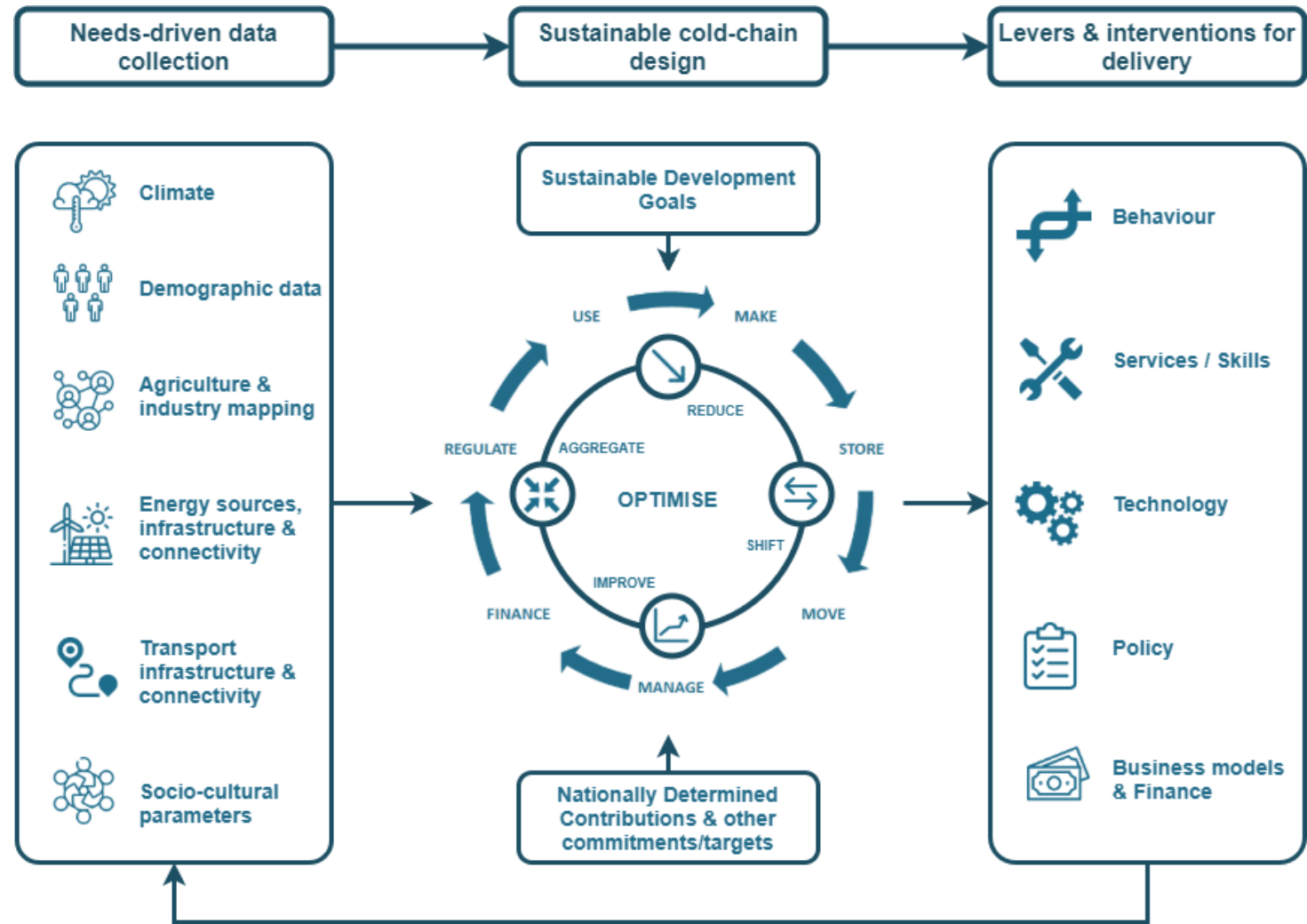
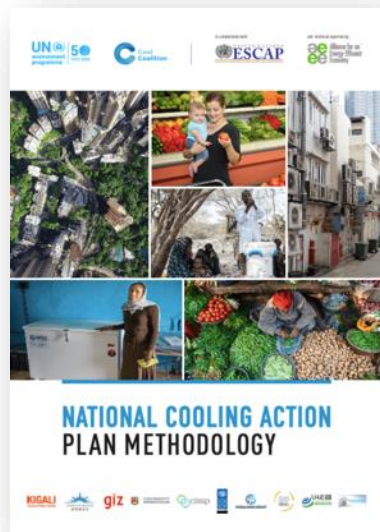
Leaving no one behind

Taking a localized perspective.

Taking a future-oriented approach

A whole-system, needs-driven approach

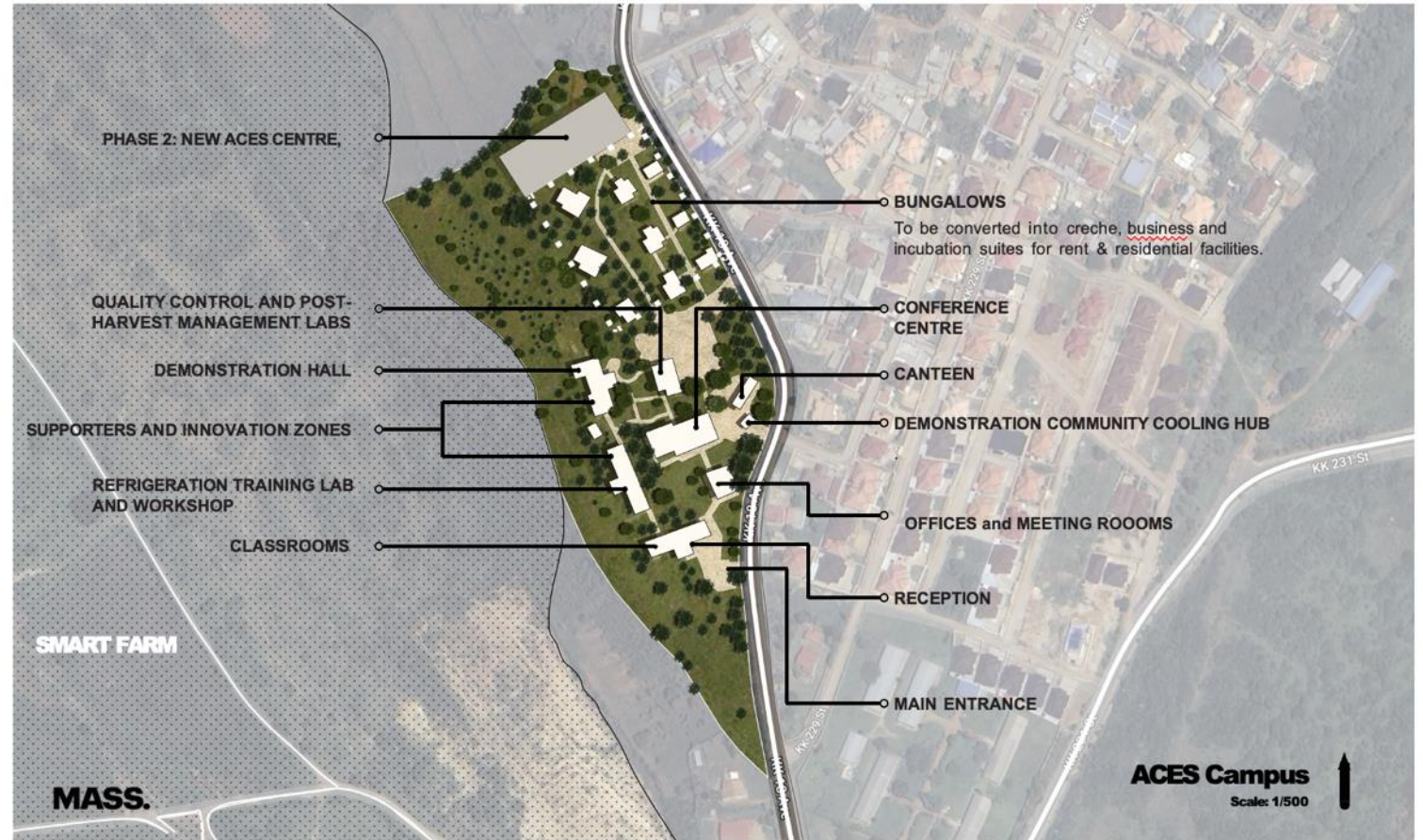
Institute multidisciplinary centres



A dedicated campus to solve the wicked problem

ACES is a demonstration of how we can work together, to help tackle rising emissions and keep alive the goal of limiting average global temperature rises.”

COP President, the Rt. Hon. Alok Sharma MP



For further information or to engage

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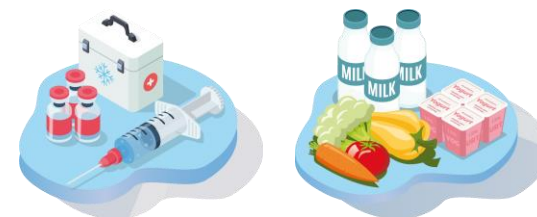
www.coolingafrica.org

TACKLING COLD CHAIN AND FOOD LOSS IN INDIA

- Over **60%** of the population directly or indirectly in agrarian economy.
- Doubling Farmers Income Report- **34-44%** of fruits –vegetables annual loss
- **4%** of countries produce benefits from cold-chain

The Government of India has made cold chain development a priority:

- ✓ Ministry of Agriculture: **National Centre for Cold Chain Development**
- ✓ **Needs Assessment Report** led to shift focus from blind investment in large storage, to end-to-end cold chain.
- ✓ Ministry of Environment - **National Cooling Action** packhouses should increase
- ✓ from 500 to 125,000 by 2037 and reefer transport from 15,000 to 400,000 by 2037.



Cold Chain Components	Refrigerant based Cooling Demand (million TR)			Energy Consumption (TWh)		
	2017	2027	2037	2017	2027	2037
Cold Storage	0.56	0.70	0.80	4.15	5.67	6.33
Pack House	0.004	0.47	1.07	0.02	2.35	5.25
Reefer Vehicle	0.014	0.14	0.40	-	-	-
Ripening chamber	0.015	0.12	0.19	0.12	0.90	1.43

Source, ICAP, 2019.



CASE STUDY: INDIA'S HOLISTIC APPROACH TO COLD CHAIN

- ✓ **System Demonstrators** : Kinnow fruit case study: **measure impact** of cold chain from farmgate to market over 2500km and demonstrate **business model**: participating farmers and aggregators funded all operations, with technical support – leading to **market transformation** with 9 new packhouses the following year
- ✓ **Guidelines for Cold Chain Development** – Standards for efficiency performance, envelope, alternative/renewable technology
- ✓ **Capacity and training programmes** – to build necessary skills and capacity of workforce, FPOs, SMEs etc..

WITHOUT cold chain

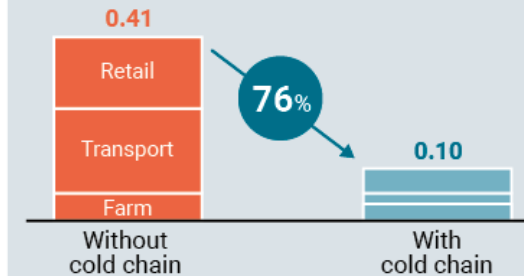


WITH cold chain



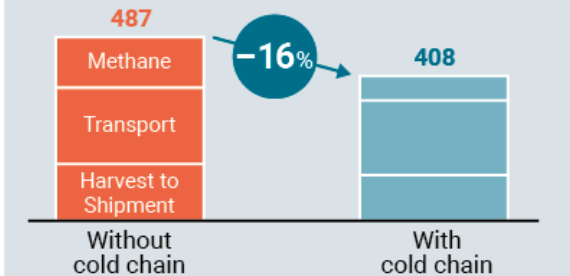
FOOD LOSS REDUCTION

MT of losses/MT sold up to consumer level



CO₂e EMISSION REDUCTION

kg CO₂/MT sold at the consumer level



10x INCREASE IN PROFITS FOR FARM-GATE SUPPLIER

Source: Pawanexh Kohli 2017

Significant challenges for the implementation of sustainable cold-chain remain - lack of awareness, capacity, limited access to policies and schemes, lack of finance, participatory business models.

UNEP's new **Cold-chain Support Programme** will help national government and states mainstream efficient, renewable, climate-friendly cold-chain infrastructure and services for horticulture in rural areas.



The programme will:

- **Show impact of innovative technology and business models** through demonstration projects in selected states
- **Scale business models through new financing mechanisms** including an investment program with EESL
- Prepare **cold-chain plans in selected states** covering infrastructure planning, policy, finance, and capacity building support **awareness raising, capacity building, knowledge management**
- Develop **efficient packhouse design guidelines** (Ministry of Power's Bureau of Energy Efficiency)

BRINGING SUSTAINABLE COLD CHAIN TO SCALE

We cannot achieve sustainable cold chain without working together across ministries

- **Ministry of Environment:** refrigerants and energy emissions, environment impacts; NCAPs, KIPs, needs assessments
- **Ministry of Agriculture:** reduce food loss and waste, help raise farmers incomes, develop economic guidelines
- **Ministry of Energy:** energy efficiency and renewable, MEPS, standards, energy policy and incentives
- **Ministry of Commerce:** logistics, export/imports

Need to build capacity on the importance and relevance of cold chain across all entities, and ensure policies, programmes and incentives are coordinated and aligned towards same goals

- Proposal to establish a training network of ozone and agriculture officers – start creating an ecosystem of policymakers that can help unlock sustainable cold chain development and advance best practices

Cool Coalition Cold Chain Working Group: co-lead by FAO & IRENA –contributing to Rome Declaration



THANK YOU!

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UNIDO KCEP Project 180009

<https://open.unido.org/projects/M0/projects/180009>

Assessment of Incremental Capital and Operating Costs for Improved Energy Efficiency (EE) in Retail Refrigeration

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Assessment of Incremental Capital and Operating Costs for Improved Energy Efficiency (EE) in Retail Refrigeration

[https://open.unido.org/api/documents/21332830/download/Retail%20sector%20Decision%20tree%20brochure%20\(1\).pdf](https://open.unido.org/api/documents/21332830/download/Retail%20sector%20Decision%20tree%20brochure%20(1).pdf)

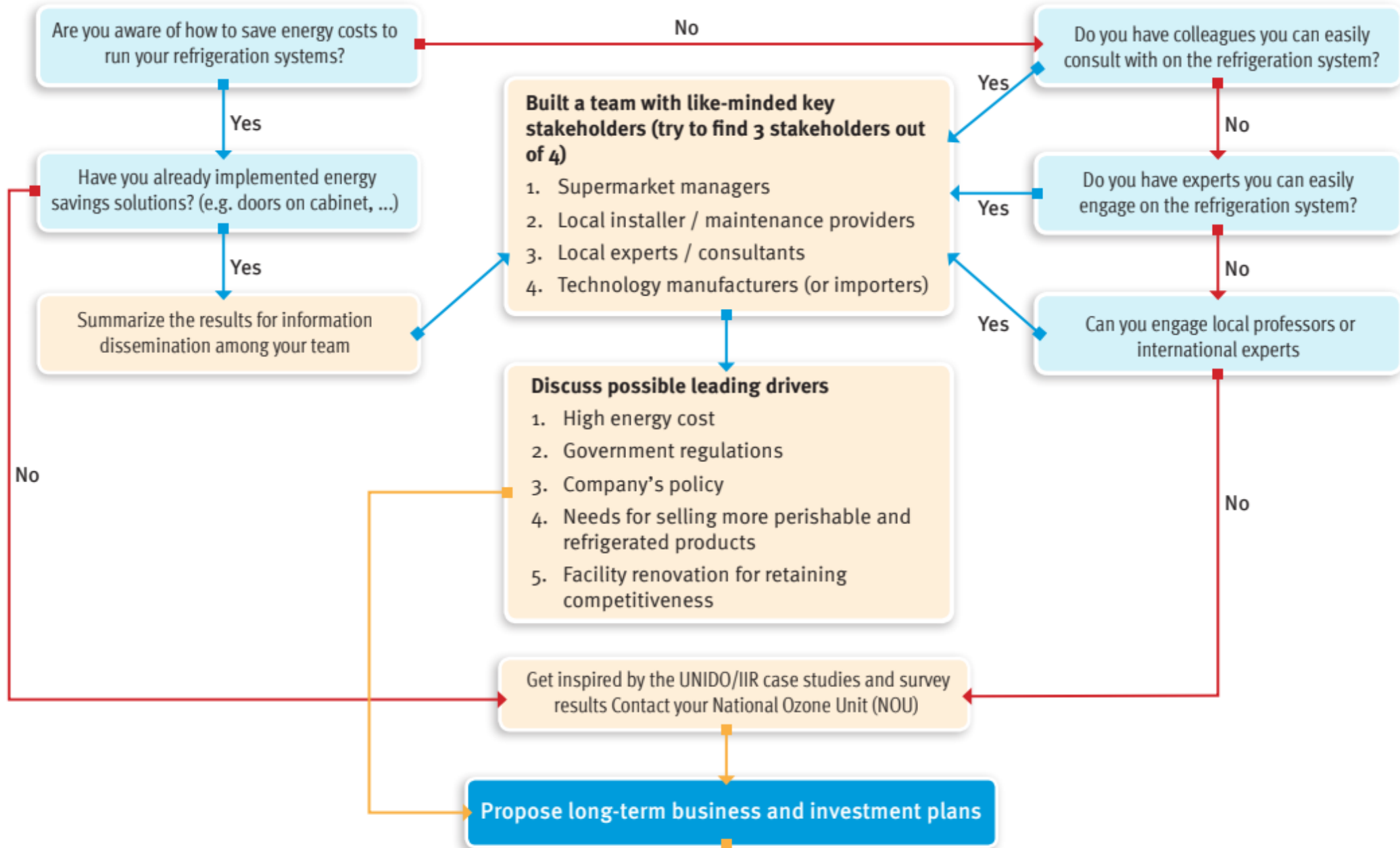
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Decision Tree

1- Get to know your environment to get closer to competent people



2- Make the adequate technical choice, depending on your technical environment

(availability of local competencies, maintenance, components, ...)

